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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/575,492

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EXAMINER

ISAAC, STANETTA D

ART UNIT

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/575,492	<b>Applicant(s)</b> MAEKAWA ET AL.	
	<b>Examiner</b> STANETTA D. ISAAC	<b>Art Unit</b> 2812	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 04 January 2010.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-27 and 29-49 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-17, 19-27, 29, 30, 36, 37 and 39-47 is/are allowed.
- 6) ☒ Claim(s) 18, 31-35, 38, 48 and 49 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>1/04/10</u> . | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

This Office Action is in response to the amendment filed on 1/04/10. Currently, claims 1-27 and 29-49 are pending.

#### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1/40/10 has been entered.

#### ***Information Disclosure Statement***

2. The information disclosure statement (IDS) was submitted on 1/04/10. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

#### ***Response to Arguments***

3. Applicant's arguments filed 1/04/10 have been fully considered but they are not persuasive. In the Remarks on pages 14-20:

4. Applicant raises the clear issue whether Hashimoto alone or in combination with Kimura suggests forming selectively a first lyophilic region in the first liquid-repellent region.

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5. The Examiner takes the position that Hashimoto in view of Kimura does suggest the above statements. It appears that the Applicant is implying that selectively the first lyophilic region and the first liquid-repellent region are formed simultaneously. However, in the claims broadest interpretation, both regions (first lyophilic and first liquid-repellent) are not required to be formed adjacently. The claim language states “forming selectively a first lyophilic region *in* (intentionally emphasized) the first liquid-repellent region”, thus having the first liquid-repellent region to be the *whole* surface where the first lyophilic region is being formed *within* the *whole* first liquid-repellent surface, as taught by Hashimoto, would not be preclude as a “first lyophilic region in the first liquid-repellent region”.

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 48 recites the limitation "the second lyophilic region" in 7. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 18, 31-35, 38, 48 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto et al (US PGPub.2003/0083203, hereinafter referred to as “Hashimoto”) in view of Kimura et al (US PGPub 2004/0142544, hereinafter referred to as “Kimura”).

Hashimoto discloses the semiconductor method as claimed. See figures 1-13, and corresponding text, where Hashimoto shows, pertaining to claim 18, a method of manufacturing a thin film transistor, comprising the steps of: forming a first liquid-repellent region by a plasma treatment on a surface for forming a gate electrode in an upper portion of the semiconductor film ([0087] and [0097-0098]); forming selectively a first lyophilic region in the first liquid-repellent region; and forming conductive film in the first lyophilic region of the surface of the semiconductor film dropping a composition including a conductive material ([0102]).

Hashimoto shows, pertaining to claim 31, a droplet discharging method, comprising the steps of: forming a lyophilic region by irradiating selectively on an object to be treated in which a liquid-repellent region is formed with light by a light irradiation unit([0087] and [0097-0098]; ([0100]) ); and discharging a droplet onto the lyophilic region by a droplet discharging unit, in a treatment chamber including the droplet discharging unit and the light irradiation unit ([0102]).

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Hashimoto shows, pertaining to claim 32, a droplet discharging method, using a treatment apparatus in which a first treatment chamber having a plasma unit and a dielectric, and a second treatment chamber having a droplet discharging unit and a light irradiation unit, comprising the steps of: forming a liquid-repellent region in an object to be treated by the plasma unit and the dielectric in the first treatment chamber ([0087] and [0097-0098]); transporting the object to be treated into the second treatment chamber without being exposed to the atmosphere; forming selectively a lyophilic region in the object to be treated in which a liquid-repellent region is formed by the light irradiation unit in the second treatment chamber ([0100]); and discharging a droplet onto the lyophilic region by the droplet discharging unit ([0102]).

Hashimoto shows, pertaining to claim 33, wherein the droplet discharging unit and the light irradiation unit are integrally formed ([0115]).

Hashimoto shows, pertaining to claim 34, wherein the light irradiation unit includes laser light ([0115]).

Hashimoto shows, pertaining to claim 35, wherein the composition is dropped by an ink-jetting method ([0102]).

Hashimoto shows, pertaining to claim 49, wherein the first conductive material and the second conductive material are the same material (figure 1; [0101-0102], [0114])

However, Hashimoto fails to show, pertaining to claim 18, forming selectively a (first) lyophilic region in the liquid-repellent region so that the surface includes the lyophilic region and the liquid-repellent region. In addition, Hashimoto fails to show, pertaining to claim 4, wherein the plasma treatment is performed at a pressure of 100 Torr to 1000 Torr. Finally, Hashimoto fails to show, pertaining to claims 18 and 48, forming a source electrode, drain electrode, gate

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insulating layer and gate electrode. Hashimoto fails to show, pertaining to claim 38, wherein the first liquid-repellent region is formed by forming a  $\text{CF}_2$  bond on the surface by plasma treatment.

Hashimoto teaches performing a plasma treatment to create a liquid repellent ([0097-0098]).

Kimura teaches, pertaining to claim 18, using laser irradiation to heat specific regions of the semiconductor film forming irradiated and non-irradiated regions, creating TFTs for driving circuits with faster switching characteristics, and TFTs for pixels that withstand high voltage (see figures 1B and 1C; [0038-0039]). In addition, Kimura teaches pertaining to claims 18 and 48, manufacturing thin film transistors that conventionally include a source electrode **111a**, drain electrode **111b** gate insulating layer **107** and gate electrode (figure 1E; [0039], [0046]).

1. It would have been obvious to one of ordinary skill in the art at the time of the invention to selectively form a (first) lyophilic region in the liquid-repellent region so that the surface includes the lyophilic region and the liquid-repellent region; forming a source electrode, drain electrode, gate insulating layer and gate electrode, in the method of Hashimoto, for its benefits of heating specific regions; and, as disclosed by the Kimura. The substitution of heating specific regions would be within the skill of one of ordinary skill in the art with the motivation of forming a strong attraction at the surface of the semiconductor film creating a smoothly uniformed crystalline surface that provides faster switching characteristics at the irradiated portions and at the non-irradiated portions an ability to withstand high voltages. Also, regarding the plasma treatment being performed at a pressure of 100 Torr to 1000 Torr, pressure are parameters of optimization (*See In re Aller, Lancey and Hall* (10 USPQ 233-237)) where one of ordinary skill in the art would be capable of producing the desired parameters based on routine

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experimentation, for the purpose of creating a liquid repellent region. Forming a source electrode, drain electrode gate insulating layer and gate electrode, in the method of Hashimoto, as taught by both Hashimoto in view of Kimura, would be obvious since both references teach forming integrated circuits known in the art where thin-film transistors would not be precluded as a known device that conventionally incorporate source electrode, drain electrode, gate insulating layer and gate electrodes to form the device. Finally, forming a liquid-repellent region by forming a  $\text{CF}_2$  bond on the surface by plasma treatment would be obvious based on the teachings of Hashimoto performing the plasma treatment on the surface to create the liquid-repellent surface by using a fluorine based gas, such as, tetrafluoromethane ( $\text{CF}_4$ ).

***Allowable Subject Matter***

2. Claims 1-17, 19-27, 29, 30, 36, 37 and 39-47 are allowed over the prior art of record. allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to STANETTA D. ISAAC whose telephone number is (571)272-1671. The examiner can normally be reached on Monday-Friday 9:30am -6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Garber can be reached on 571-272-2194. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Stanetta Isaac  
Patent Examiner  
March 25, 2010

/Charles D. Garber/  
Supervisory Patent Examiner, Art Unit 2812